Historic England

Assessing SHINE features in the Lake District National Park using the NCA/Cultural Capital process: Summary

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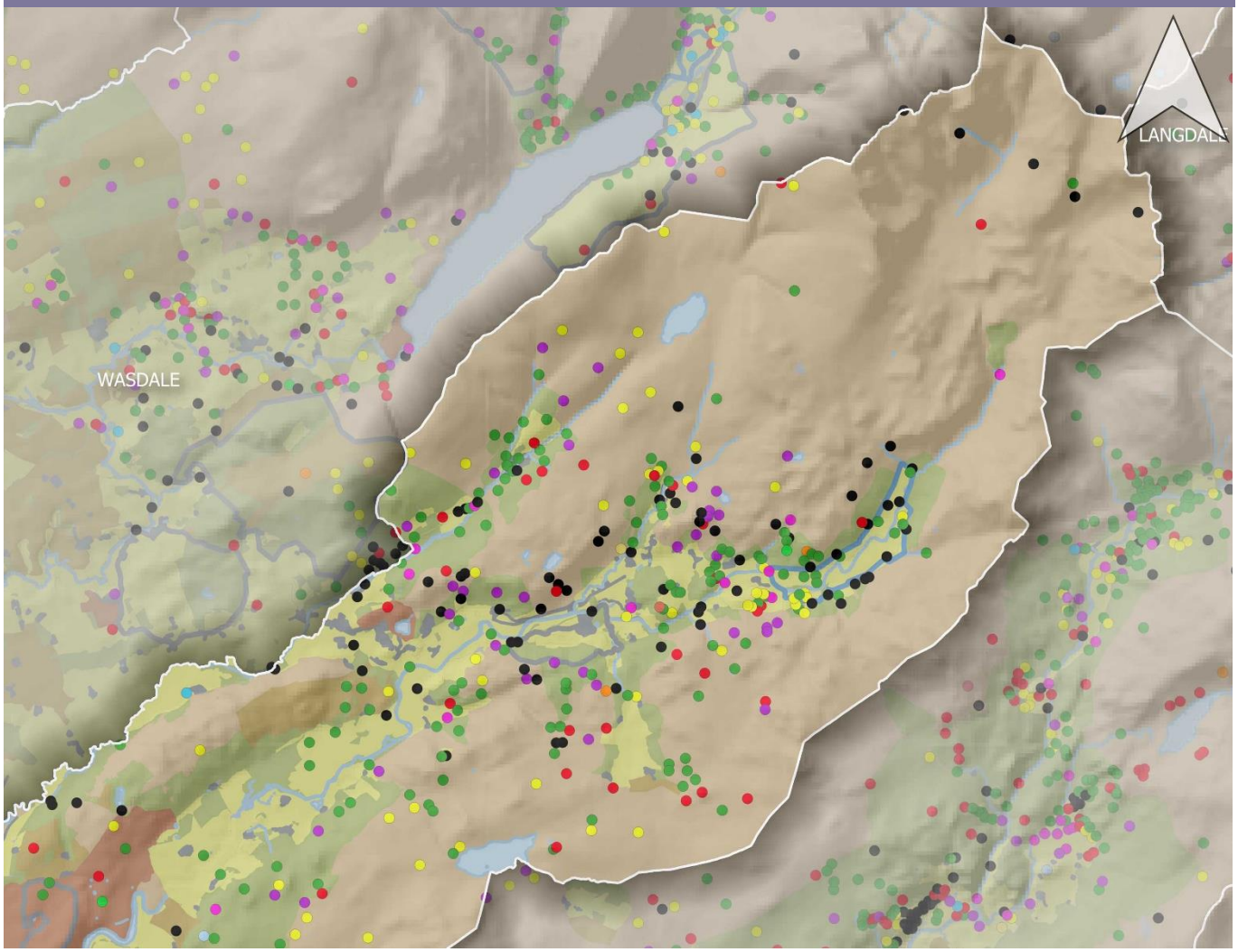
Discovery, Innovation and Science in the Historic Environment



Summary

1 BACKGROUND TO THE PROJECT

Increasing weight is being attached to the use of Natural Capital Accounting (NCA) to assess the flow of stocks relating to cultural and other services in order to underpin delivery of the 25 Year Environment Plan (25YEP, the goals for improving the environment) and performance against other environmental targets. NCA is also likely to be used to identify and prioritise the public goods that the new Environmental Land Management Scheme (ELMS) might deliver in England.

Currently, Historic Environment Farm Environment Records underpin Countryside Stewardship. They act as the link between farmers and land managers, local authority curators and Historic England. They ensure that the key heritage features on a holding are identified, that the issues affecting them are addressed through appropriate options, and that unintentional detrimental impacts are avoided. These key heritage features are included within the Selected Heritage Inventory for Natural England (SHINE) dataset. They have not been assessed before using the NCA approach.

The results of the project will be used to:

- Inform wider policy work nationally, specifically the development of ELMS, and the inclusion of non-designated heritage in future iterations of the 25YEP and subsequent Environmental Improvement Plans (EIPs).
- Help Historic England to understand whether Agri-Environment Schemes (AES) have contributed to the management of the Outstanding Universal Value (OUV) attributes of the World Heritage Site (WHS) in the Lake District National Park (LDNP).

Historic England, in partnership with the Lake District National Park Authority (LDNPA), has identified a need to explore and develop methodologies capable of capturing the values of the natural capital and ecosystem services flowing from the historic environment. The overarching focus of this project is to develop and implement a research methodology to improve the assessment of values arising from the historic environment in order to contribute to improved decision making. The project will inform guidance for the wider heritage sector on ways to incorporate the concepts of natural capital and ecosystem services.

The project objectives are to:

1. Assess the heritage assets in the SHINE dataset and portal within the area of the LDNP WHS area using the NCA approach.
2. Consider the feasibility of assessing which features in the SHINE dataset contribute to the OUV attributes of the WHS.
3. Conceptually map 'Cultural Capital' values that are not adequately captured by the NCA approach.
4. Provide a basic economic assessment of the value the assets bring to the local economy through their contribution they make to 'place'.
5. Identify the tourism value of SHINE features.
6. Determine the impact of AES and other spending on SHINE features.
7. Work with the Cumbria Pioneer ELMS Test and Trial (T&T) to explore how well the SHINE approach works to inform historic environment asset assessment.

8. Assess whether it is possible to attach a value to heritage assets which can be used to outline the benefits to partners, policy makers, farmers and land managers of including heritage features in ELMS.
9. Identify the cultural services/public goods that are derived from these assets and the valuation of these and the case for public payments for maintaining and enhancing these public goods through ELMS.

2 OVERVIEW OF THE HISTORIC ENVIRONMENT OF THE LAKE DISTRICT NATIONAL PARK

The LDNP is a landscape of farmed valleys, with lakes, rivers and woodland, dominated by its fells and mountains. It was inscribed as a WHS on 9 July 2017, the boundaries matching those of the National Park, and is thus one of a number of places around the world which are considered by the United Nations Educational, Scientific and Cultural Organisation (UNESCO) to have OUV. The attributes and components that combine to give the Lake District its OUV, and which result from its distinct topography and history, fall 'under three intertwining and interdependent themes':

- Theme 1: A landscape of exceptional beauty, shaped by persistent and distinctive agro-pastoral traditions and local industry which give it special character.
- Theme 2: A landscape which has inspired artistic and literary movements and generated ideas about landscapes that have had global influence and left their physical mark.
- Theme 3: A landscape which has been the catalyst for key developments in the national and international protection of landscapes.

The SHINE records which are the focus of this project relate to structures, above-ground and below-ground features that fall within the context of the cultural landscape of the National Park and its 13 valleys (Figure 2.1). Farmsteads and other settlements are concentrated in the medieval inbye land of the valley bottoms and the later intakes and unenclosed land of the valley sides, which extend towards the communal grazing land of the open fells. Most of the intakes date from between the 16th and early 19th centuries and were mostly taken in to provide cow pastures close to a decreasing number of farmsteads, but some represent medieval encroachment into the open wastes and commons. Routeways, known as 'outgangs', extend from the valleys to the fells which have since the prehistoric period been a vital source of stone, minerals, fuel, fodder and open grazing. On the fells are the earthworks of huts and enclosures dating from the prehistoric period and the remains of temporary shielings for communities grazing their livestock over the summer months, that date from the medieval period. The amalgamation of farms over the 18th and 19th centuries was accompanied by the rebuilding of farmsteads and, in some areas, by the removal and realignment of some field boundaries and regular enclosures of remaining common fields and fell sides. Within and bordering the inbye land are farmsteads dating from the medieval period with houses and barns dating from the 17th century.

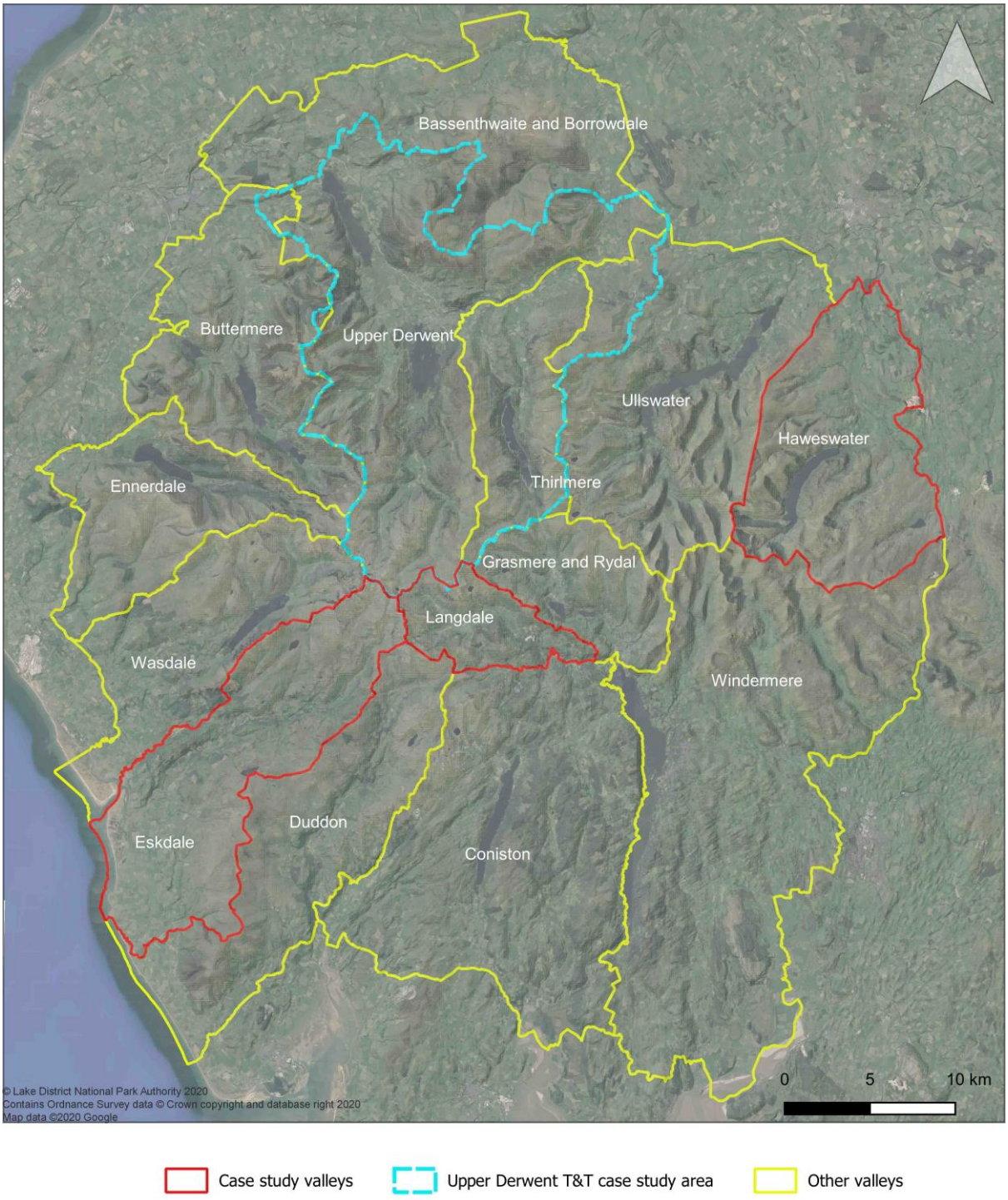


Figure 2.1: Map showing the 13 valleys of the LDNP WHS

3 METHODOLOGY

3.1 Assessing the heritage assets in the SHINE dataset using the NCA approach

The SHINE dataset was conceived in 2008 to achieve a single, nationally consistent dataset of non-designated heritage assets, derived from Historic Environment Records (HERs), that could benefit from management through the Environmental Stewardship AES and to provide ways in which those data could be taken into account through historic and other scheme options.

The first stage of the project comprised a comprehensive description and classification of the heritage features, in terms of number, type, date and spatial distribution, contained in the SHINE dataset. Of fundamental importance to this stage was ensuring that the methodology for analysis of the data could be used in other areas of the country, through consistency of approach to the assembly of HER/SHINE data by date and type prior to its analysis, processing and presentation. The data processing and analysis was performed using the open source statistical programming language 'R'[1]. The full R code written for the project is available on the project's GitHub site[2].

3.2 Using SHINE data to explore ways of integrating with the NCA approach

The SHINE features form part of the stock of cultural capital, contributing to the landscape and ecosystem service provision of the LDNP WHS area in multiple ways. The features will vary in their contribution to the services generated by natural capital and therefore it might seem appropriate to take a NCA approach to explore the value of the SHINE features in relation to the total stock of natural capital. The key contribution of SHINE features are in the form of cultural ecosystem services and the range of benefits flowing from those services. The focus of the approach taken in this study is not on valuing the capital itself, but on measuring the cultural ecosystem service benefits flowing from the features over time, as part of the wider stock of capital both existing in, and contributing to, the landscape.

Figure 3.1 illustrates the basic approach taken to valuing the SHINE assets in the LDNP WHS area whereby the SHINE assets represent the stock of natural capital, and the benefit flows and beneficiaries are identified and valued over specific periods of time. For the purposes of this study only cultural services are examined. Cultural services are the most relevant to capturing the role of heritage assets in the landscape but tend to be the least explored aspect of ecosystem service studies. Cultural services formed the focus of the study described here.

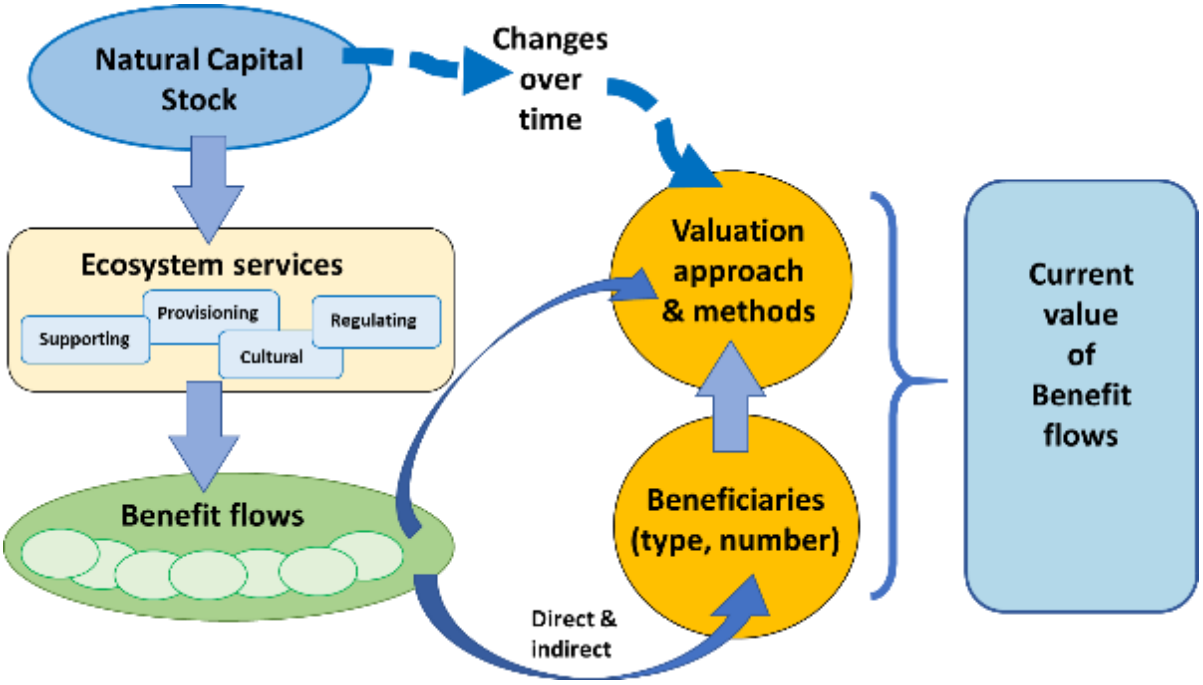


Figure 3.1: Conceptual overview: Natural capital accounting approach

[1] https://www.r-project.org/about.html.
[2] https://github.com/robertberryuk/SHINE

Case study approach

An analysis of the full SHINE data set for the LDNP was too large of a task given time and resource constraints. The research is therefore based on a case study approach to try and capture some of the variability across the LDNP. Four case study areas were selected for model development and testing:

- Eskdale, which has 451 SHINE features within an area of 162.39 km^2 that extends from the border with Langdale towards the sea.
- Langdale, which has 325 SHINE features within a relatively small area of 42.20 km^2 and forms part of the hub of the 'wheel' of Lake District valleys.
- Haweswater, which has 754 SHINE features within an area of 145 km^2 that extends from the border with Windermere to the Lowther estate in the Eden Valley.
- Upper Derwent T&T area, which has 1,133 SHINE features within an area of 360.18 km^2 that comprises the majority of the valleys of Borrowdale and Bassenthwaite, together with Thirlmere and a small part of Ullswater.

The case study areas were also selected to reflect central and more remote sites, a range of residents living in each area, and variability in visitor numbers.

The basic methodology was the development of a return-on-investment (ROI) model building on previous work to assess the value of ecosystem services linked to linear landscape features, and buildings and structures. A conceptual diagram of the model is illustrated in Figure 3.2.

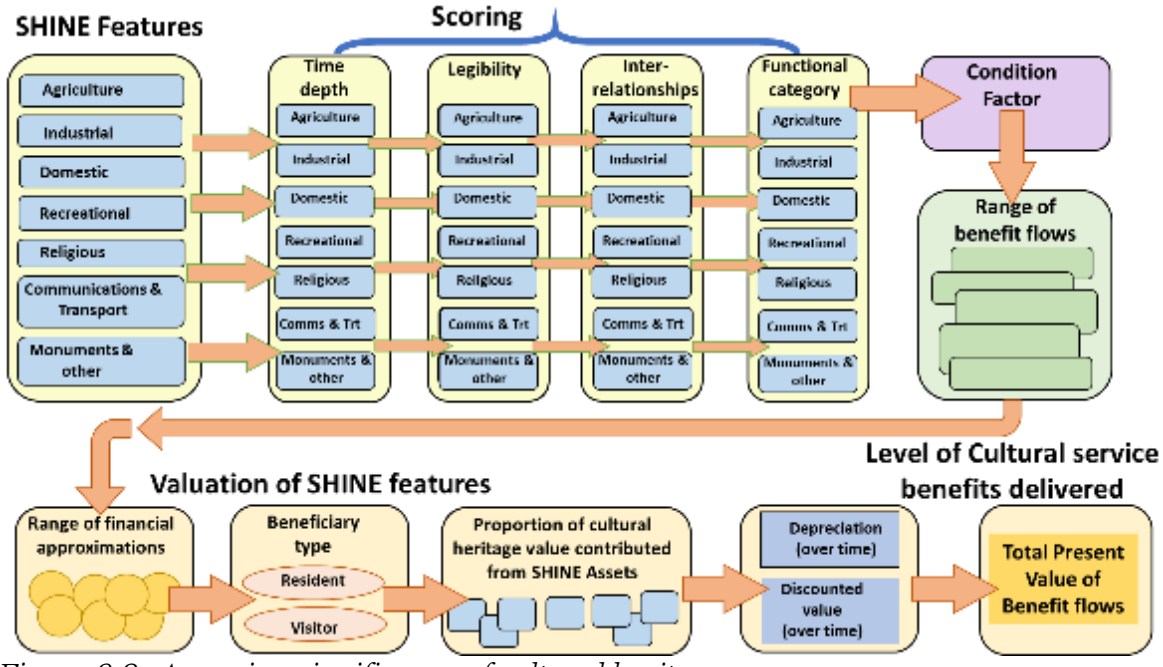


Figure 3.2: Assessing significance of cultural heritage

Scoring the condition of SHINE assets was based on two surveys of the condition of cultural heritage carried out in Haweswater and Eskdale. Condition for the ELM Upper Derwent T&T area assets were estimated based on the average condition from the other two areas. Financial approximations were derived from a range of sources, in particular other ROI studies that have utilised the same approximations for valuing similar types of benefit flow. Beneficiaries were limited to three categories: visitors, residents, and livestock farmers.

A key issue in developing the methodology was understanding the nature of the SHINE assets in relation to the total stock of heritage assets and the landscape in the area. Taken

together, therefore, SHINE assets form part of what can be defined as the natural capital stock, which extends to walls and other features in the landscape and includes intangible heritage and viewpoints which contribute to OUV.

The approach taken was based on the assumption that residents and visitors are not differentiating between the services and benefits generated by SHINE and non-SHINE capital stock. They are experiencing a complete socio-ecological system of the LDNP landscape and thus the values generated by the model are for the total set of benefit flows created from all the natural capital in a specific area. In order to determine the contribution of SHINE features, assumptions had to be made about the proportion of total value contributed by these features alone. SHINE assets were compared at the county level with the full set of records in the Historic Environment Record (HER) and expert judgement was utilised to estimate that 40% of the cultural heritage services are delivered by the SHINE assets.

The model accounts for this proportion of total cultural services value by using a density function based on the average number of SHINE features per km^2 in each of the case study areas. The density function contains only the SHINE features which are then used to calculate the value of benefit flows from the cultural ecosystem services for each case study area. Indicators were developed to enable the SHINE assets to be scored in terms of their age (time depth), legibility (extent to which they are visible and contribute to 'telling a story' that connects communities and people to their past), condition, function and inter-relationships with the wider landscape (Figure 3.3).

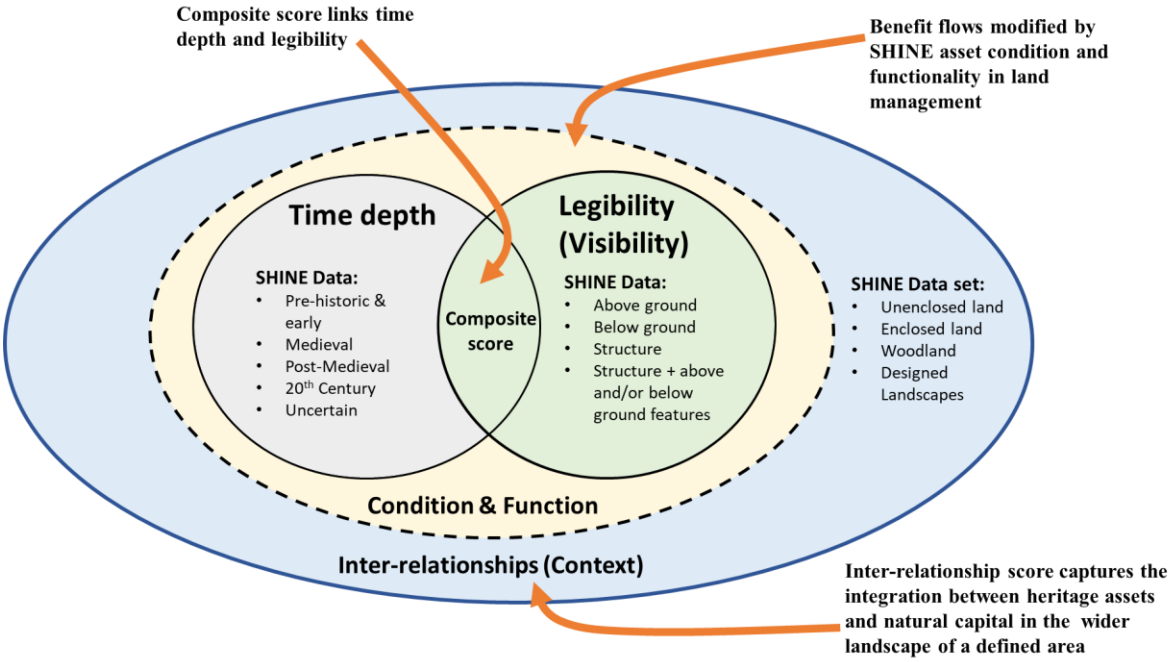


Figure 3.3: Scoring of cultural heritage assets

3.3 Assessing the effectiveness of the SHINE approach in informing the management of heritage assets and the historic environment in the Lake District

Where data sources were available a quantitative analysis of the spend on SHINE assets was undertaken. Following this analysis the impact of the spend on SHINE assets was investigated through:

- A review of secondary sources (reports, surveys, assessments) produced by Historic England, Defra, Natural England, LDNPA and Local Government.
- Telephone interviews with four heritage professionals with knowledge of the impact of AES and other spending on SHINE assets.
- A workshop held with stakeholders from the T&T team and organisations with experience of heritage asset management under AES.

This was followed by a closer look at how the SHINE approach could inform historic environment asset assessment as part of the Cumbria Pioneer ELMS T&T. A second workshop session was held with nine stakeholders from the T&T team and organisations with experience of heritage asset management under AES. To assess whether it is possible to attach a value to heritage assets which can be used to outline the benefits to partners, farmers and landowners of including heritage features in ELMS a workshop was held with 12 stakeholders from organisations with experience of heritage asset management under AES.

4 RESULTS

4.1 Assess the heritage assets in the SHINE dataset and portal within the area of the LDNP WHS area using the NCA approach

Following analysis of SHINE data via the HER, 7,484 SHINE records were identified.

Analysis by Form

Analysis by Form provides a good indicator of the legibility of SHINE features. It demonstrates that above-ground features and structures dominate the SHINE record and, in general, that their respective categories are primarily the result of long or sudden redundancy:

- 4,483 (59.9%) are above-ground heritage features (excluding structures), which overwhelmingly comprise earthwork remains (former settlements, agricultural, religious and industrial features) and other remains dating from the prehistoric to the post-medieval periods, including quarries, mines and charcoal-burning platforms in woodland.
- 152 (2.0%) have known above- and below-ground elements, dating from the prehistoric period and including stone circles, Bronze Age cairnfields, a Roman road, medieval houses, shielings and abandoned farmsteads and mines, bloomeries and other industrial sites.
- 2,763 entries (36.9%) comprise structures. These include prehistoric standing stones and cairns, medieval boundary walls and the remains of medieval buildings, field systems and enclosures. Most are post-medieval in date and comprise agricultural buildings and structures, bridges, domestic and a smaller proportion of industrial sites from lime kilns to bobbin mills.
- 86 (1.2%) comprise below-ground remains, including cropmarks and other sites of uncertain date and the sites of demolished buildings including those of post-medieval date.

Analysis by Type

The following nine classes - making up 97.5% of all recorded types - are those considered to be the most relevant, being an integral part of the agro-pastoral landscape and how it has been perceived and valued: Agriculture and Subsistence (2,272; 30.4%); Industrial (2,421; 32.3%); Domestic (496; 6.6%); Religious, Ritual and Funerary (716; 9.7%); Transport (427;

5.7%); Gardens, Parks and Urban Spaces (46, 0.6%); Recreational (14; 0.2%); Monument (821; 11.0%) and Unassigned (86; 1.2%).

Analysis by Period

Analysis by Period demonstrates that:

- 493 (6.6%) heritage assets can be dated to the Prehistoric period, including agricultural earthwork remains, Neolithic stone axe factories (Industrial), trackways in unenclosed land (Transport), cairnfields (Religious) and probable settlement and agricultural earthworks which have been assigned to the Monuments by Form category.
- 26 (0.3%) are Romano-British, including features associated with roads, forts and vicus settlements but excluding Scheduled Monuments.
- 15 (0.2%) are Early Medieval, including shielings, cairns, settlement and church sites.
- 669 (8.9%) are Medieval, displaying a wide typological range but dominated by those in the Agriculture and Subsistence category.
- 4,061 (54.3%) are Post-Medieval which includes a higher proportion of Industrial sites.
- 158 (2.1%) are 20th century, including many identified in their addresses as Post-medieval and a wide typological range including sheepfolds, building platforms and anti-invasion defences.
- 2,045 (27.3%) are categorised as 'Uncertain' because they cannot be dated with any certainty, although they include many sites identified in the titles for their individual entries (Unique Identifiers) as Post-medieval.

How SHINE contributes to the historic environment

SHINE records comprise a proportion of a varied heritage of features, sites, structures and buildings (collectively known as 'heritage assets') whose value is also enhanced and whose understanding is enriched by the historic landscapes in which they are seen and valued. The former is conditioned by their degree of survival (as earthworks or structures) and the latter conditioned by awareness of what lies beneath the ground, the enhanced understanding delivered by new discoveries and changing perceptions of significance. This calls for an integrative approach that takes account of changing functions, perceptions and the whole character of landscapes.

Relationship to non-designated and designated heritage assets

Within the LDNP there are 287 Scheduled Monuments, 1,793 List Entries covering around 2,000 listed buildings and structures, 23 Conservation Areas, 9 RPGs and part of the Hadrian's Wall WHS. Most Scheduled Monuments are found on the fells, and many comprise coherent assemblages of hut circles, traces of field systems and ritual and burial sites and structures. Most listed buildings are concentrated in the enclosed landscapes of the valley bottoms and sides, with non-designated historic buildings being afforded a greater degree of protection if they exist within those settlement cores and groupings of buildings which have been designated as Conservation Areas.

SHINE records comprise 42% of the records shown in the Lake District HER, which includes listed and unlisted buildings, designated and non-designated archaeological features, chance finds and linear or enclosure structures (including some but not all dry stone walls of particular note, such as ring garth walls and walls to deer parks, and folds for the

shelter, handling and washing of sheep). These show a marked variation between asset types.

Relationship of SHINE data to historic landscape

Over 90% of the landscapes in which SHINE data are located derive from the agro-pastoral tradition, comprising a wide variety of enclosed land, unenclosed land and ancient woodland including boundary features, veteran and historic trees that have the potential to be managed through a wide range of options in the AES.

Patterns of historic landscape character have been mapped as polygons by the Lake District Historic Landscape Characterisation (HLC), as completed in 2009, and have been brought together into a national database using grid cells by the National HLC. The function of SHINE data, to inform AES, explains a concentration away from areas of mapped historic settlements, with their historic buildings and other archaeological sites.

Unenclosed Land indicates the open fells and commons of the Lake District comprising 53% of the total area of the WHS. These landscapes have for centuries been utilised by surrounding communities for summer grazing, with peat, heather and bracken cut for fuel, bedding, roofing and fodder. The unenclosed land of the upland fells retains a high concentration of prehistoric settlement (Agriculture and Subsistence), settlement (Domestic) and ritual sites (Religious) with communication routes still visible over the upper passes.

Enclosed Land comprises farmland subdivided into fields by dry stone walls, banks and hedgerows. These take up just over 53% of the area as mapped by National HLC (in comparison to a national average of 72%), dominated by Ancient Fields (32.3%, these being mostly enclosed by the end of the 17th century) with substantial areas of Planned Fields (mostly late 18th and 19th century) and Post-War Fields (10.0%).

Parks and Gardens, 0.7% of the area as mapped by National HLC and termed as Designed Landscapes in the Lake District HLC and Cultural Landscape Maps, mostly date from the late 18th century and provide the settings to the villas which are such a significant and distinctive part of the Lake District landscape. They can have scatters of earlier features dating from the prehistoric period – sometimes purposefully included as part of their planning and design.

Woodland includes significant concentrations of Ancient Woodland (2.6% of the area as mapped by National HLC), which can have dense concentrations of industrial sites. Designed landscapes can also retain dense clusters of industrial and other sites which have been absorbed within the expansion of parks and gardens. Broadleaved woodland is clustered in the sheltered valleys, along rivers and lakeside margins. Where it survives, it has been strictly controlled and intensively managed from the medieval period onwards as enclosed woodland for growing timber and coppiced underwood, to supply building materials, domestic fuel and charcoal for smelting. Conifer Plantations, which date from the late 19th century takes up 7.6% of the area as mapped by National HLC: it can retain SHINE features that result from earlier patterns of land use and settlement. Water comprises bodies of freshwater and water sports areas and takes up 3.0% of the area as mapped by National HLC. It is associated with five Maritime entries, comprising quays, jetties and a warehouse, and mostly comprises lakes and reservoirs.

4.2 Consider the feasibility of assessing which features in the SHINE dataset contribute to the OUV attributes of the WHS

SHINE features are a significant part of the attributes and components that combine to give the Lake District its OUV, as defined by ICOMOS in the justification for Inscription of the World Heritage Site. They enable appreciation and understanding of historic land use, through physical, visual and intellectual access to them. They complement the evidence offered by designated heritage assets and the historic landscape and provide the foundations for the living traditions of the Lake District, the development of the Picturesque movement and its distinctive legacy, and the development from the late 19th century of a landscape conservation movement of global importance.

SHINE features making the most significant contribution to OUV are those that provide evidence for and illustrate the development of its farmed landscape and the management of the fells as common land. In summary:

- Theme 1: A landscape of exceptional beauty, shaped by persistent and distinctive agro-pastoral and local industry:

  All SHINE features are sited within landscapes that have been shaped by the Agro-pastoral Tradition, and enable appreciation and understanding of historic land use, through physical, visual and intellectual access to them. Of particular importance are those in the following categories which date from the prehistoric period:

  - Agriculture and Subsistence: Archaeological features, structures and farm buildings make a very strong contribution to appreciation and understanding of historic land use – particularly of prehistoric to medieval land use in the grazed open commons and medieval to post-medieval land use in enclosed land.
  - Domestic, Religion, Ritual and Funerary: sites and structures dating from the prehistoric period similarly enhance appreciation and understanding of historic land use and settlement, particularly in the unenclosed commons.
  - Industrial: Archaeological features and structures enhance appreciation and understanding of how the mineral resources of the Lake District have been exploited and exported since the Neolithic period within enclosed and unenclosed land, and also how fuel has been generated as a result of charcoal burning in woodland.
  - Transport: archaeological features, including the remains of trackways and Roman roads in unenclosed land, linking valleys and extending beyond the Lake District, trackways within and relating to field systems and settlements and bridges enabling communication within and beyond the Lake District across streams and rivers.

- Theme 2: A landscape which has inspired artistic and literary movements:
  - Only a very small number of Commemorative and Recreational SHINE asset types result from or directly reflect changing perceptions of cultural landscapes and scenic beauty that underpins this theme, which is otherwise vividly expressed through a cultural heritage of villas, designed landscapes and other features not eligible for inclusion in SHINE. Access to and appreciation of SHINE features in the landscape, however, benefits people through access to and appreciation of different archaeological features and sites dating from the prehistoric period, of individual structures such as sheep folds and bields and of a variety of historic (mostly farm) buildings using distinctive local styles and materials. The Statement of OUV states – with reference to Criterion V for the selection of WHSs - that the spiritual and physical benefits provided to people by the landscape are founded on

the inherited landscapes and traditions of agro-pastoralism and underpinned by the aims of the National Park 'to maintain the scenic and harmonious beauty of the cultural landscape; to support and maintain traditional agro-pastoral farming; and to provide access and opportunities for people to enjoy the special qualities of the area and have developed in recent times to include enhancement and resilience of the natural environment.'

- Theme 3: A landscape which has been the catalyst for key developments in the national and international protection of landscapes:
    - This is again underpinned by the agro-pastoral landscape and traditions, which illustrate understanding of the Lake District landscape as the catalyst for key developments in the national and international protection of landscapes. Visitors and local businesses benefit from good stewardship of the historic environment and of individual heritage assets, evident through the care and maintenance of archaeological features and historic farm buildings.

4.3 Conceptually map 'Cultural Capital' values that are not adequately captured by the NCA approach

The SHINE data consists of physical assets allocated to seven use categories. Although these assets form only around 42% of the total number of identified physical assets in Cumbria they do contribute in terms of influencing the collective character of an area, mainly related to landscape and settlement patterns, and to a much lesser extent they also contribute to Practice and process structures through reminders of the long history of livestock management on the fells.

Figure 4.1 indicates that the ecosystem services generated by the cultural capital in the SHINE assets comes from its contribution to the formation of assemblages and patterns (i.e. landscapes) valued by residents and visitors. However, some of the physical assets themselves also deliver CES that generate benefit flows as well as enhancing wellbeing. The research carried out for this project has focused only on the ecosystem services generated directly by the cultural capital, and not on other services generated by the material assets (the stock of capital), such as provisioning, which would capture, for example, the full range of economic benefits for the local area through tourism.

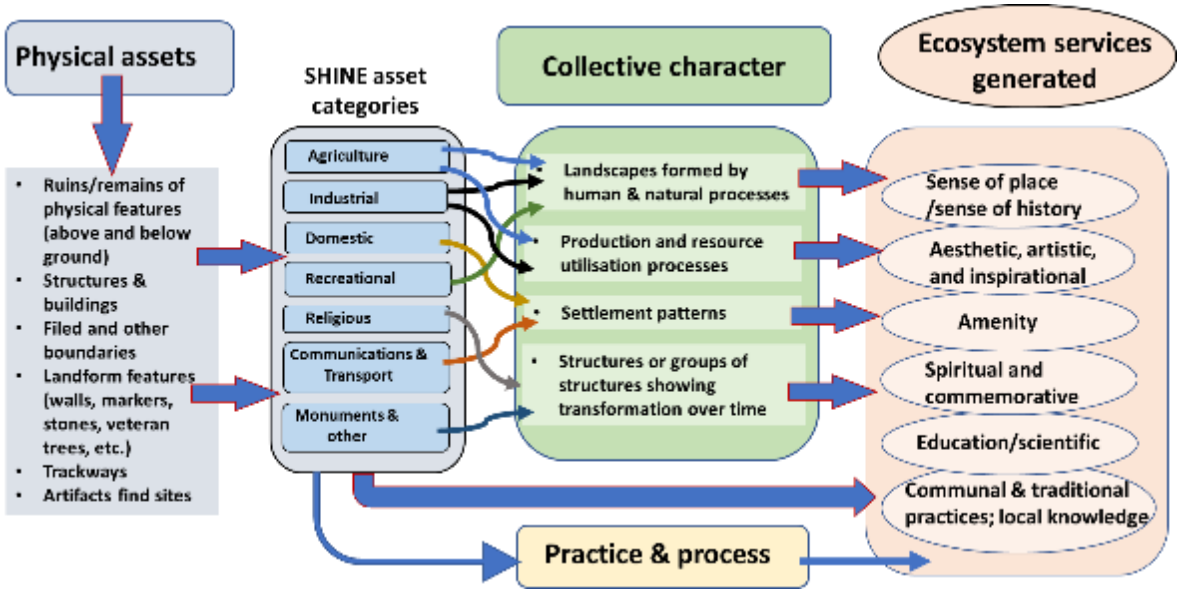


Figure 4.1: Mapping the 'socio-ecological system service flows' from the SHINE cultural capital assets

The SHINE assets only form part of the cultural heritage of an area, they are a partial selection of the physical assets with incomplete information - a significant proportion of the HER assets are not dated, and there is an almost complete absence of asset condition data, making valuation very difficult.

Determination of the value of benefits deriving from cultural capital is not possible by separating out some assets from their larger context, and their inter-relationships with the full range of heritage assets in an area, limiting the potential utility of the SHINE data as a means to value cultural heritage across an area. Physical assets are reduced to features which a farmer may or may not be paid to manage, with only limited understanding of their level of significance in the local area. With limited understanding of the assets and their role in the landscape those utilising the functional structures may not appreciate their value in the landscape character formation. The outcome potentially, is isolation of a set of physical assets, a decline in cultural capital, and a decline or loss of ecosystem services and the benefits that flow from them.

4.4 Provide a basic economic assessment of the value the assets bring to the local economy through their contribution they make to 'place'

A social return-on-investment model was developed for the study to explore the value of cultural services generated in terms of benefit flows over time to identified sectors of the population. Each case study area was considered separately to enable application of local contextual data such as population size, farmer numbers, and visitor numbers. The model was limited to valuing the 'direct' non-market benefits arising from heritage assets in each case study area. The term 'direct' refers to benefits experienced directly by those living in and visiting the area. The model does not incorporate indirect non-market values (such as existence, bequest, and option values) related to the stock of cultural heritage capital, and neither does it include market values and employment creation arising from such activities as tourism, a portion of which could be attributed to cultural heritage of an area. The model outputs, therefore, can be considered as a conservative estimate of the value of benefits generated by the cultural heritage in each case study area.

The valuation model outputs are summarized in Tables 4.1-4.4. The tables indicate the present value of cultural services from SHINE assets over a 10-year period, discounted at 3.5% annually. Model outputs reveal that the largest proportion of cultural service value is contributed from agricultural/subsistence assets, which is not surprising given the high proportion of this category of asset in the SHINE dataset. Agricultural/subsistence assets contribute slightly more than half of the value of benefit flows in each of the areas (ranging from 52 to 62%). There is more variability in benefits flowing from industrial heritage, the Upper Derwent T&T area has the largest proportion of industrial assets (25.8%) of the three areas, and Haweswater the lowest at 12.7%.

The majority of value in each case study comes from Agriculture and industry (ranging from 67% to 78% of the total value). Agricultural/subsistence assets comprise the largest category of assets in each case study area, and also contribute more significantly to generating flows of benefits. The lowest values come from recreation assets. This is not surprising given the small number of assets in this category in the SHINE dataset. It must be kept in mind that the values generated by the model represent the identified benefit flows to visitors and residents.

Values range from a low of £100.4 million to £363.8 million over a ten-year period. Total present values over the ten-year period are significantly higher in Langdale and the Upper Derwent T&T areas than for the other two case studies.

The higher value of the benefit flows from the Upper Derwent T&T area would be expected given its much larger area, the greater number of heritage assets, a larger resident population, and a much larger number of visitors than the other areas.

Table 4.1: Eskdale: Present value of cultural services generated by SHINE assets over a 10-year period

SHINE Asset Category	Total Present value (over 10 yrs)	% of total value (over 10 yrs)
Agricultural/subsistence	£52,969,131	52.74%
Industrial	£14,295,846	14.23%
Domestic	£10,007,092	9.96%
Recreation	£487,358	0.49%
Religious	£16,147,807	16.08%
Communication/transport	£2,761,697	2.75%
Monuments + other	£3,768,905	3.75%
Total	**£100,437,836**	**100.00%**

Table 4.2: Haweswater: Present value of cultural services generated by SHINE assets over a 10-year period

SHINE Asset Category	Total Present value (over 10 yrs)	% of total value (over 10 yrs)
Agricultural/subsistence	£124,058,838	55.44%
Industrial	£28,393,823	12.69%
Domestic	£16,948,251	7.57%
Recreation	£1,320,643	0.59%
Religious	£24,960,152	11.15%
Communication/transport	£18,489,001	8.26%
Monuments + other	£9,596,672	4.29%
Total	**£223,767,380**	**100.00%**

Table 4.3: Langdale: Present value of cultural services generated by SHINE assets over a 10-year period.

SHINE Asset Category	Total Present value (over 10 yrs)	% of total value (over 10 yrs)
Agricultural/subsistence	£224,113,137	61.98%
Industrial	£59,907,398	16.57%
Domestic	£26,791,920	7.41%
Recreation	£832,047	0.23%
Religious	£10,483,795	2.90%
Communication/transport	£22,465,274	6.21%
Monuments + other	£16,973,763	4.69%
Total	**£361,567,334**	**100.00%**

Table 4.4: Upper Derwent T & T area: Present value of cultural services generated by SHINE assets over a 10-year period.

SHINE Asset Category	Total Present value (over 10 yrs)	% of total value (over 10 yrs)
Agricultural/subsistence	£192,850,501	53.01%
Industrial	£94,058,163	25.85%
Domestic	£18,259,825	5.02%
Recreation	£2,508,218	0.69%
Religious	£24,229,383	6.66%
Communication/transport	£16,052,593	4.41%
Monuments + other	£15,851,936	4.36%
Total	**£363,810,617**	**100.00%**

The model also indicated that 80 – 90% of values are generated by visitors, the remainder by residents. Again, this is not unexpected given the huge numbers of visitors to the LDNP,

which vastly outweigh the relatively small number of residents. It must be kept in mind that the valuation model is a conservative estimate of values generated by cultural heritage based solely on direct experience and does not include indirect values that might be attributed to the wider population.

4.5 Identify the tourism value of SHINE features

The 'tourism value' of SHINE features is intimately tied up with their effect on the physical landscape. The model explored the generation of direct benefits flowing largely to residents and visitors, but it has not examined the economic services and benefits generated in the region through tourism. Identifying the tourism value of SHINE features is difficult in two ways:

- Assumptions about visitor numbers and benefits obtained from visits are made from limited tourism survey information.
- SHINE features are fully integrated with other heritage assets to create the cultural landscape; separating out one set of assets from the rest is an artificial exercise that cannot be undertaken with any level of accuracy.

In the model assumptions have been made for the number of tourists benefitting from different service flows. This varies from 25% who may benefit from improved knowledge and understanding from a visit to 67% who may benefit from improvement in wellbeing. One way to estimate the tourism value would be to assume that around two thirds of visitors benefit from an improvement in well-being and apply that to the economic benefits generated by tourism to arrive at a 'tourism value' of cultural heritage. Taking 42% of this value will then give an estimate of the 'tourism value' of SHINE assets. Tourism economic impact data for the Lake District National Park indicates a total economic impact from tourism of £1.480 billion for 2018. This is based on 28.55 million visitor days generated from 19.8 million visitors. Applying the suggested calculation outlined above, the economic impact of the cultural heritage is £962 million per annum and 42% of this, is £404 million per year, which could be potentially identified as the 'tourism value' of the SHINE features. A similar approach using slightly different data from 2018 based on average daily spend of visitors and average expenditure on accommodation of staying visitors in Cumbria provides a slightly lower estimate of £359.6 million per year for the tourism value of SHINE assets. Both of these calculations assume that the cultural heritage is a key element attracting the visitors to travel to the Lake District, but it is important to keep in mind that a significant proportion of visitors undertake more than one activity in a single visit, so the cultural heritage itself is not always the sole, or even key reason, for visiting.

An alternative approach would be to explore the different areas of spending and allocate proportions of relevant spending to the proportion of visitors who derive some benefit from the cultural heritage of the area. The limited information on reasons for visiting, and on locations visited, would make this a difficult task. A more valid approach would be to expand the current ecosystem services model to incorporate provisioning services and calculate the value of economic service generated by cultural heritage, an activity that was not possible within the current project due to time and resource constraints.

4.6 Determine the impact of AES and other spending on SHINE features

Funding streams associated with the management of SHINE features were identified. Quantitative data were identified for the Countryside Stewardship and Environmental Stewardship AES and analysis of the spend on heritage features was undertaken. It was not possible to link spending directly to SHINE features. The total spend on heritage options at the end of 2019 was £4,812,159 with 65.6% being spent on historic landscapes, 19.0% on boundaries and 15.4% on historic and archaeological features. It was concluded that

Countryside Stewardship is helping to maintain and enhance the protective management of heritage features on farmland which contribute to the broader OUV of the Lake District, particularly field boundaries and traditional farm buildings rather than features with a high likelihood of being recorded in the SHINE dataset.

Although the Environmental Stewardship scheme closed to new applicants in 2014 and is being wound down, the spend on the HLS options within the remaining agreements has been almost twice that compared to Countryside Stewardship (£8.9 million), with 63.5% being spent on boundaries, 34.9% on historic landscapes, and 1.6% on historic and archaeological features. It was noted that within ELS agreements, which are based on an area payment, two options, ED5 and UD13, were particularly valuable for the protection of archaeological features and the maintenance of their visibility. As with Countryside Stewardship, it was concluded that Environmental Stewardship is helping to maintain and enhance the protective management of heritage features on farmland which contribute to the broader OUV of the Lake District to a greater extent than features with a high likelihood of being recorded in the SHINE dataset.

The literature review found that that there is little secondary information available on the impact of AES spending on SHINE features. A qualitative exploration of the impact of AES spending on SHINE features was undertaken using telephone interviews and a workshop with heritage professionals. It was reported that both Environmental Stewardship and Countryside Stewardship were having a positive impact on the management of SHINE features and the broader historic environment. However, it was considered that, from an historic environment perspective, input to and the outcomes delivered by Environmental Stewardship were superior to the subsequent Countryside Stewardship AES.

Knowledge exchange opportunities between farmers and land managers and heritage advisors was raised as an issue affecting heritage asset assessment and management. The ability to meet face-to-face was considered a very important part of the process. Such meetings facilitated greater understanding by applicants, agents and advisors of the benefits that can accrue from historic environment options, as well as those derived from other options, whose implementation can also benefit heritage features. Conversely, it also enabled the specialist advisors to understand better the issues being faced by applicants and how those issues influenced the options being applied for.

Overall, the SHINE approach is considered to have performed reasonably well and effectively in difficult circumstances that have become more difficult as time and schemes have progressed. It was recognised that there were some weaknesses in the SHINE dataset and the process by which SHINE data was used to inform the development of AES agreements. There were mixed views on whether the SHINE approach should be reformed or replaced by cost-effective direct analysis of HERs, thereby avoiding the costs of maintenance and enhancement of two databases. Such an approach could, for example, assist in identifying and (as far as possible) smoothing out cross-border anomalies. Other datasets such as the National Character Area Profiles (NCAP) and HLC should also be used, in tandem, in order to ensure that SHINE data are understood and properly managed in relationship to field boundaries and other features in their contextual landscape.

4.7 Work with the Cumbria Pioneer ELMS Test and Trial (T&T) to explore how well the SHINE approach works to inform historic environment asset assessment

The project investigated how well the SHINE approach works to inform heritage asset assessment as part of the Area Plans (AP) and Land Management Plans (LMP) being developed as part of the Cumbria Pioneer ELMS T&T. A workshop was held with

stakeholders from the T&T team and organisations with AES heritage experience and augmented with telephone interviews with heritage professionals with knowledge of AES implementation. It was reported that the SHINE dataset could provide some of the information required to generate baseline information on heritage assets for ELMS and inform ELMS public goods priorities. It was suggested that the SHINE approach required further development to be fully effective in informing ELMS in relation to the following issues:

- The SHINE dataset has variable coverage of heritage asset categories and needs to be understood in relationship to other aspects of the historic environment including the mapping of historic landscape character.
- SHINE omits Scheduled Monuments and highly-graded (I and II*) listed buildings but this is a limitation which can be easily overcome through the integration of Historic England data.
- SHINE does not contain data on the condition of assets needed to inform management practice.
- SHINE is a collection of individual heritage assets and does not consider these assets in the context of the broader historic landscape.

4.8 Assess whether it is possible to attach a value to heritage assets which can be used to outline the benefits to partners, policy makers, farmers and land managers of including heritage features in ELMS.

The project explored whether it is possible to attach a value to heritage assets which can be used to outline the benefits to partners, farmers and land managers of heritage features in ELMS. Two sources of information fed into this, the valuation modelling of the SHINE data and a stakeholder workshop. It was clear from the workshop that the historic environment is not fully appreciated by many farmers and land managers, their agents, Natural England project officers and RPA staff. This is not necessarily the result of indifference, more the product of different specialisms, interests and understanding and lack of effective training. If the importance of the historic environment is to be fully acknowledged in the development and delivery of ELMS, then a significantly enhanced understanding of the nature, content, role and potential of the historic environment in the delivery of public goods needs to be established among land managers, advisers and delivery bodies. It would be more effective if SHINE or successor heritage consultations within ELMS were made at the same time as those covering other objectives.

4.9 Identify the cultural services/public goods that are derived from these assets and the valuation of these and the case for public payments for maintaining and enhancing these public goods through ELMS

The project focused on exploring and valuing the benefits flowing from ecosystem services generated by the cultural capital embodied in the SHINE assets. In order to assess the benefits flowing from each ecosystem service it is necessary to identify the categories of beneficiary, the number of beneficiaries in each category, and the manner in which they benefit. In order to understand the magnitude of benefits some measure of value is required. The approach taken in this research is a return-on-investment model whereby the level of benefits generated annually are assessed for each identified service flow within a defined geographic area.

The public benefits from SHINE assets are created largely by private actions of landowners and managers on private and land with varying degrees of public rights of access. The impact of private land management, however, has implications far beyond the ownership

boundaries, influencing public goods in the form of a valued cultural heritage landscape, and the aesthetic, spiritual, sense of place, amenity, and wellbeing benefits that flow from it. Land managers do not necessarily recognise the significance of individual historic assets in contributing to wider landscape values and benefit flows, and managing historic assets can involve a cost, in terms of lost productive land, or particular management actions that require resource inputs. Given the scale of public benefits, and the reliance on private land managers to protect a relatively small number of historic assets from degradation and disappearance there is a case for public payments for maintaining and enhancing these assets through ELMS, in order to ensure the continued generation of the public benefits shared by residents, visitors, and even those who have never visited the area.

5 RECOMMENDATIONS

1. There should be greater recognition of the value of SHINE as a dataset which reflects the attributes and components of locally-distinctive landscapes that can also be of regional and national importance.
2. There must also be recognition of the fundamental contribution of the historic environment as a whole, and that in recognising the heritage element of features such as field boundaries, a more-integrated approach to Natural Capital is required in order to maximise the range of public benefits and goods that can be delivered through agri-environment schemes. Related to this, there should also be acknowledgement of the interaction of Natural and Cultural Capital, and the contribution that the latter makes to sense of place, sense of history and other cultural ecosystem services.
3. Following on from the above, there should be a recognised and nationally-consistent framework (at national and NCAP level) to aid in the identification and assessment of non-designated heritage assets, distinguishing those which make a strong contribution to local character and those of national importance, of equivalent significance to designated assets but which remain undesignated.
4. Variations within and between HERs in the location, type and date of SHINE data (including those in the Monuments (by Form not Function) and Unassigned categories) need to be acknowledged within historic and natural landscape contexts, so that any omissions (for example of scattered earthworks in areas of dispersed settlement) can be identified. Options need to build on this understanding of local variation and have sufficient flexibility and simplicity for delivery within the context of individual farm plans.
5. Steps should be taken to ensure that traditional farm buildings are included comprehensively in HERs and thus within SHINE, which can be undertaken at an initial desk-based level through Farmstead Mapping.
6. Initial analysis of the SHINE dataset should be undertaken at a national level, using and refining the techniques outlined in this project, and in relationship to the NCAPs and National HLC, in order to better understand variations in the distribution, quantity and quality of data across and between HERs. The effectiveness of and improvements to SHINE, and better understanding of its potential in a landscape context, could be effectively delivered through the selection of sample areas in contrasting landscape types.
7. Scaling up the work to a sub-national level – including National Parks and AONBs - should select contrasting historic and present land use areas and types within or across the NCAPs, which are characterised by different drivers for change and pressures on heritage assets.
8. As a first step, the valuation model should be applied to a selection of other protected areas in order to explore the variability in data availability and quality. The valuation model requires some refinement in two areas:

    a. Expansion to incorporate the full range of ecosystem services (through building on previous work in valuing linear features buildings and structures)
    b. Refinement of the methodology for assessing cultural ecosystem service values that incorporates a three-pronged approach accounting for values of physical assets, character, and practice and process in local areas.

9. Provide test cases in a range of different settings to improve the capacity of the model as a tool for providing reliable valuations and identify the relevant sources of empirical and secondary information required.
10. Address gaps in the evidence base on the impact of AES and other spending on SHINE features.
11. Natural England and RPA databases monitoring take-up, coverage and spend within Countryside Stewardship, and in future ELMS, agreements and options should include a 'tag/variable' for SHINE assets. This would enable spend and uptake statistics to be generated for options directly connected to SHINE assets.
12. Current databases on the Natural England Open Data Geoportal only include live agreements. Easier access to AES agreement and options data for all agreements would facilitate analysis of spend and option uptake over the duration of a scheme.
13. Use heritage asset valuation to outline the benefits to partners, farmers and land managers of including heritage features in ELMS.
14. Given the potential for providing some indication of monetary value for heritage assets in a defined area, and the evidence from the workshop, guidance should be developed that works at a national level and can then be linked to the NCAPs, demonstrating the value of and enabling users to see how farm buildings/other structures, and heritage assets relate to patterns and assemblages in the landscape and different ways that land is managed.
15. The valuation approach should also be used at character area level to indicate to land managers and other relevant stakeholders how changes in condition and existence of heritage assets could impact on local landscape character, the local economy, and wider social and cultural values.
16. This approach should be piloted in the Lake District and a small number of other areas. Development of a simple toolkit would be massively useful and also take the strain off the (possibly diminishing number of) heritage advisers who cannot be expected to offer advice on every holding without a large increase in funding. Inter-disciplinary approaches would be required to make training effective for all other ELMS advisors.
17. Use the SHINE approach (or an alternative form of direct analysis of the HERs) to inform Land Management Plans and Area Plans. This could apply to future T&T initiatives and the ELMS National Pilot which is due to start in later 2021 and full ELMS delivery.
18. The SHINE approach should be developed and improved to provide baseline data for ELMS:
    a. Include scheduled heritage assets.
    b. Expand coverage to include all heritage assets that contribute to OUV, such as traditional buildings and field boundaries.
    c. Integrate the SHINE dataset of tangible heritage assets with approaches that include intangible elements of cultural landscapes, e.g. livestock management practices.
19. Consideration should be given to the role of specialist advice in the management of heritage assets and how this is integrated into LMPs.

20. The role of independent advice should be considered. This should be seen not as a cost but as an essential investment to maximise the array of public goods delivered through options across a holding.
21. Consideration should be given to incorporating data on the condition of heritage assets in the SHINE dataset as information on the condition of assets is needed to inform management practice. Condition surveys of heritage assets could be undertaken as part of the LMP.
22. Consideration should be given to cost: benefit or return-on-investment analysis of further investment in the development of the SHINE dataset (derived from the HERs) against the development of an algorithm that enables direct analysis of the HERs and the NCAP and HLC datasets.